

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
13 January 2005 (13.01.2005)

PCT

(10) International Publication Number
WO 2005/002466 A2

- (51) International Patent Classification⁷: **A61F**
- (21) International Application Number:
PCT/IL2004/000601
- (22) International Filing Date: 6 July 2004 (06.07.2004)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
60/485,156 8 July 2003 (08.07.2003) US
- (71) Applicant (for all designated States except US): **VENTOR TECHNOLOGIES LTD.** [IL/IL]; Baratz, Bar-Natan, Horn, c/o Yuval Horn, Azrieli Bldg., 18th floor, 67 021 Tel Aviv (IL).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): **SCHWAMMEN-THAL, Ehud** [IL/IL]; 6 Hazait Street, 43 263 Raanana (IL). **TUVAL, Yossi** [IL/IL]; 19 Itamar Ben Avi Street, 42308 Natania (IL). **BENARY, Raphael** [IL/IL]; 15 HaRav Ashi Street, 69 395 Tel Aviv (IL).
- (74) Agent: **G.E. EHRlich (1995) LTD.**; 11 Menachem Begin Street, 52 521 Ramat Gan (IL).
- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).
- Published:**
— without international search report and to be republished upon receipt of that report
- For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: **IMPLANTABLE PROSTHETIC DEVICES PARTICULARLY FOR TRANSARTERIAL DELIVERY IN THE TREATMENT OF AORTIC STENOSIS, AND METHODS OF IMPLANTING SUCH DEVICES**

(57) Abstract: Prosthetic devices as described for use in the treatment of aortic stenosis in the aortic valve of a patient's heart, the prosthetic device having a compressed state for transarterial delivery and being expandable to an expanded state for implantation. The prosthetic device includes an expandable metal base constructed so as to be implantable in the expanded state of the prosthetic device in the aortic annulus of the aortic valve; and an inner envelope lining the inner surface of the metal base. The inner envelope, in the expanded state of the prosthetic device, extends into the aorta and is of a diverging conical configuration, in which its diameter gradually increases from its proximal end within the aortic annulus to its distal end extending into the aorta, such as to produce, during systole, a non-turbulent blood flow into the aorta with pressure recovery at the distal end of the inner envelope. Preferably, the distal end includes a prosthetic valve which is also concurrently implanted, but such a prosthetic valve may be implanted separately in the aorta. Also described are preferred methods of implanting such prosthetic devices.

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